

ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

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**XI.—TROPICAL AGRICULTURAL COLLEGE IN
THE WEST INDIES.**

The proposal to establish a Tropical Agricultural College in the West Indies, which has been under consideration for some time, is dealt with fully in the following paper.

COLONIAL OFFICE TO ROYAL GARDENS, KEW.

Downing Street,

24th February, 1920.

Sir,

I am directed to transmit to you printed copies of the Report of the Tropical Agricultural College Committee, and of the Secretary of State's despatch sending the Report to the Governments of the West Indian Colonies for consideration.

I am, Sir,

Your obedient servant,

G. GRINDLE.

DOWNING STREET,

27th January, 1920.

Sir,

In my despatch of the 11th September I informed you that I had appointed a Committee to consider whether it was advisable to found an Agricultural College in the West Indies, and, if in the Committee's opinion the answer to this question was in the affirmative, to make recommendations in regard to the situation, constitution, management, scope, finance, buildings, and any other matters which required to be considered in connection with the foundation of the proposed College.

2. It will be observed that I was fortunate enough to secure for the Committee the services of many of the most eminent men in the field of tropical agriculture, and of leading members of the West Indian commercial community in this country.

3. I now have the honour to transmit to you the Report of the Committee, who were unanimously of the opinion that steps should be taken at an early date to found a Tropical Agricultural College in the British West Indies.

4. The Committee refer to the Agricultural Colleges which have been established in Porto Rico, Hawaii, and Louisiana. They draw attention to the fact that the establishment of the proposed College is a matter of concern to the Empire at large, and of special interest to the other tropical Colonies and to the United Kingdom.

As regards the site of the College, the Committee recommend that Trinidad should be chosen if the Colonial Government is prepared to afford adequate support and other reasonable facilities. The Committee regarded Jamaica as in many respects the most suitable Colony for the purpose, but they came to the conclusion that considerations of inter-colonial transit would make it very difficult to place the College there.

The Committee make recommendations in some detail for the constitution of the College and contemplate that it should be administered by a governing body meeting in London, comprising representatives of the College itself, the contributing Colonies, the contributing industries, academic institutions in the United Kingdom, and the Secretary of State. They suggest a staff of ten professors and two lecturers, and a curriculum comprising junior and senior courses of instruction, an advanced course, and arrangements for post-graduate studies of special subjects. They strongly recommend that a Sugar School should be provided and equipped with a complete plant on a small but working scale. They also suggest that, if the College were established in Trinidad, a branch for Oil Technology should be added.

As regards finance, the Committee propose that a fund of £50,000 and upwards should be raised by private subscriptions for the establishment of the College and that its maintenance should be provided for by contributions from the West Indian Colonies on a suggested basis of $\frac{1}{2}$ per cent. of their revenues, and by the Imperial Government on the basis of a grant of £1 for every £1 contributed by the Colonies, with a maximum of £15,000 a year, apart from fees and voluntary contributions.

The Committee regard it as essential that the Imperial Department of Agriculture should be closely associated with the College.

5. In my opinion the scheme propounded by the Committee is worthy of the most careful attention of the people of the West Indies. They have already had considerable experience of the economic value of agricultural science. Among the most striking examples are the improvements which have been effected both in the amount of sugar contained in canes and in the proportion which it has been possible to extract, and the history of the Sea Island cotton industry and of the measures devised to combat its pests. Much more may be expected from the establishment of an institution which will receive students from every West Indian Colony and provide a steady stream of men equipped with the most recent knowledge in the science of tropical agriculture and technology. It must not, of course, be supposed that college

training, even of the most practical kind, can supply the place of actual experience on plantations and in factories; but it can make men far better fitted to profit by that experience. Such men will bring a wide outlook to their work in field or factory, will be constantly on the watch for improvements in current practice, and, when they have gained experience, will be qualified to cope with insect pests and fungous diseases and to introduce new methods and staples without imprudence when the occasion requires it.

The proposed College offers advantages, direct or indirect, to every section of the community: to the students themselves by increasing their mental resources and economic value: to the planters, by providing them with qualified assistance: to the peasant proprietors, by placing skilled advice within easier reach and by improving the market for their produce: to factory owners, by supplying the chemical and other knowledge which is now so difficult to obtain: to the labourers, by rendering it possible for them to receive higher wages: to the general community, by the increase of trade and wealth and, not least, by supplying a means likely to mitigate the severity of those periods of economic depression which will, I fear, long remain inevitable in the future as in the past. Moreover, it is likely to attract students, some of them men of experience, from all the tropical parts of the Empire; and the West Indies, in common with the British communities of Africa, Asia, and the Pacific, will no doubt benefit from the relations which will be formed and the ideas which will be exchanged.

6. Accordingly it seems to me that the people of the West Indies have now an opportunity, which might well mark an epoch in their economic history, of founding an institution which would at present be unique in the Colonies, and that, in their existing relative prosperity, their resources are such that they may well hope that it may equal or even surpass in scope and usefulness any similar institution on foreign soil.

7. It may be of interest if I somewhat amplify the reference which the Committee make to such foreign institutions, and add a few remarks upon similar institutions in the Indian Empire. This will afford material for some discussion of the scope of the proposed College.

The Island of Porto Rico already possesses a "College of Agriculture and Mechanic Arts" associated with the University of Porto Rico. This College, situated at Mayaguez, was opened in 1912 in a building furnished at a cost of thirty thousand dollars by the Government of the Island, working under the Morrill and Nelson Fund provided by the Government of the United States. This Fund, amounting to fifty thousand dollars, is the same as that furnished to similar Colleges in the United States. Within a year of its foundation, the College had in attendance over one hundred students from all parts of the Island of Porto Rico, and its direct grant from the insular Government, over and above the sum supplied by the United States Government, was sixty-one thousand dollars for the financial year 1913-14. In addition to the primary work of teaching the principles and practice of

agriculture to the students actually enrolled, the Mayaguez institution has from the outset undertaken the important task of aiding the ordinary teachers of Porto Rico in their effort to relate school training to the daily avocations of the people. It is not clear to me how far the Porto Rico College can or does devote itself to work other than the teaching of agriculture to its students and the training of ordinary school teachers in the subject. I am aware that the College was located at Mayaguez so as to be near the Agricultural Experimental Station which was established there seventy years before the College; but if there are published papers indicating activity on the part of that College in the investigation of unsolved problems they have not been brought to my notice.

The Sugar School in Louisiana is, however, known to undertake the tasks both of imparting and of advancing knowledge. The proposed College in the British West Indies should be able to do for their people all, and more than all, that the Louisiana Institution does for the people of the United States. The College would certainly be intended to give due attention to every one of the agricultural industries and interests of the Colonies, not only as regards instruction but also as regards investigation. In this respect it should come to deserve comparison with the singularly well equipped Tropical Research Institute created by the Netherlands Government at Buitenzorg in Java, and with the similar Institute at Pusa in Behar on behalf of the Indian Empire.

At Pusa one of the most important duties to be fulfilled is that of the education, during a prescribed period and with regard to Indian conditions, of the recruits engaged for service in the agricultural departments of the various Indian Governments who have received their agricultural training at Universities and Technical Colleges in the United Kingdom. At Pusa, too, are trained for such service those natives of India who are selected with a view to filling agricultural posts under the Government of India itself. It may be assumed that the new College will do for the West Indian Colonies what Pusa does for the whole of India.

In this matter India is not differently circumstanced from the rest of the Empire. At present the men who are selected to fill the various scientific agricultural posts in the tropics of south-eastern Asia and Africa, just like those selected for service in India, have received their agricultural training in chemistry, botany, plant pathology, or general agriculture in the Universities or Colleges of Great Britain, Canada, the Union of South Africa, Australia or New Zealand. Sound and extensive though this training undoubtedly is, the fact remains that it does not really amount to a complete introduction to the specialised problems which confront the agricultural officer in tropical countries. The training imparted in a temperate climate affords the necessary groundwork on which to build up tropical experience. But much time and labour are required before the newcomer can, unaided, adapt himself to conditions that are strange and peculiar, and is in a position to make use of his gradually acquired experience for the good of the community whose Government he

serves. India has discovered this elementary truth and has taken steps to overcome the difficulty. Other tropical dependencies and Colonies have realised it too, but have been hitherto unable to apply the only rational remedy.

Besides the institution at Pusa, it has been found desirable to establish no fewer than seven agricultural Colleges in the various Provinces of India. These are for the most part occupied in the training of the sons of Indian landed proprietors.

8. As regards the site of the College, I agree with the Committee that the most suitable Colonies are Jamaica and Trinidad, and I think that in the present condition of steamship communications the balance of advantage lies with the latter. But it is not impossible that, before it becomes necessary to decide this question finally, a link may have been provided in the form of a steamship connection between Jamaica and the Lesser Antilles.

9. While I am in cordial agreement with the substance of the report, I do not feel able at present to accept it in all its details. I am doubtful about the suggestion that a branch of the College might be established for Oil Technology, but this is evidently a collateral question which forms no essential part of the scheme. I feel more serious difficulty about the proposal that the Imperial Government should be asked for financial assistance. I readily admit that the proposed College is of great importance to the United Kingdom and to the Empire at large. But there are many educational institutions in the United Kingdom which are similarly of importance to the Colonies although it is only in a very few cases that the latter make any contribution. The considerable measure of prosperity which many of the West Indian Colonies are now enjoying further weakens the case for Imperial assistance. I shall defer further consideration of this point until I have the views of the Colonies, but if Imperial assistance is not forthcoming it will evidently be necessary to raise the suggested rate of Colonial contribution.

I note that the report does not refer to the provision of courses of instruction suitable for teachers in elementary schools, but I should hope that the proposed College would find it possible to undertake this work.

10. I request that you will give the widest publicity to this despatch, and will communicate copies to the Legislature and to the agricultural and commercial institutions in the Colony, and that, when you are thoroughly informed of local public opinion on the various points raised, you will furnish me with a full report in the matter.

I have, etc.

(for the Secretary of State),

L. S. AMERY.

REPORT OF THE TROPICAL AGRICULTURAL COLLEGE COMMITTEE.

To the RIGHT HONOURABLE VISCOUNT MILNER, G.C.B., G.C.M.G.,
Secretary of State for the Colonies.

My Lord,

The Committee appointed by your Lordship on August 25th, 1919, to consider the desirability of establishing a Tropical Agricultural College in the British West Indies, and matters connected therewith, beg leave to submit their Report as follows.

2. The Committee comprises the following members:—

Dr. A. E. Shipley, LL.D., Sc.D., F.R.S., *Chairman*,
Master of Christ's College, Cambridge, and Deputy Vice-Chancellor.

Lieut.-Colonel Sir David Prain, C.M.G., C.I.E., F.R.S.,
Deputy-Chairman, Director of the Royal Botanic Gardens, Kew.

Sir Norman Lamont, Bart., Member of the Legislative Council of Trinidad and Tobago.

The Hon. Gideon Murray, M.P., late Administrator of St. Lucia.

Sir Owen Philipps, G.C.M.G., M.P.

Sir Henry Frank Heath, K.C.B., Secretary to the Department of Scientific and Industrial Research.

Sir Francis Watts, K.C.M.G., D.Sc., Imperial Commissioner of Agriculture for the West Indies.

Sir Edward Davson, President of the Associated Chambers of Commerce of the West Indies.

Dr. C. A. Barber, C.I.E., Sc.D., F.L.S., Sugar-Cane Expert for India.

Mr. Robert Rutherford, Chairman of the West India Committee.

Mr. Henry Alexander Trotter, Deputy-Chairman of the West India Committee.

Mr. Eliot Arthur de Pass, Chairman of the Jamaica Standing Committee of the West India Committee.

Dr. J. B. Farmer, M.A., D.Sc., F.R.S., Professor of Botany, Imperial College of Science and Technology.

Captain A. W. Hill, M.A., Sc.D., F.L.S., Assistant Director of the Royal Botanic Gardens, Kew.

Mr. W. H. Himbury, General Manager of the British Cotton Growing Association.

Mr. J. W. McConnel, Member of the Empire Cotton Growing Committee, Board of Trade.

Mr. G. Moody Stuart, West Indian Estates, Proprietor.

Mr. Algernon E. Aspinall, C.M.G., B.A., *Hon. Secretary*, Secretary of the West India Committee.

Sir Henry Frank Heath, K.C.B., was unable to attend any of the meetings, and was represented by Mr. A. Abbott. Dr. C. A. Barber, C.I.E., Sc.D., F.L.S., was co-opted a member of the Committee.

3. At the first meeting of the Committee, held on September 16th, Dr. A. E. Shipley, LL.D., Sc.D., F.R.S., and Lieut.-Colonel Sir David Prain, C.M.G., C.I.E., F.R.S., were appointed Chairman and Deputy-Chairman respectively, and Mr. Algernon E. Aspinall, C.M.G., B.A., Honorary Secretary.

4. The terms of reference to the Committee are set out in your Lordship's letter of August 25th, 1919, to the members of the Committee as follows:—

“To consider whether it is advisable to found an Agricultural College in the West Indies, and, if in the Committee's opinion the answer to this question is in the affirmative, to make recommendations in regard to the situation, constitution, management, scope, finance, staff, buildings, and any other matters which in the opinion of the Committee require to be considered in connection with the foundation of the proposed College.”

5. *Desirability of Establishing a College.*—The Committee desire to state at the outset that they are unanimously of the opinion that steps should be taken at an early date to found a Tropical Agricultural College in the British West Indies.

6. The need for such an institution has for some years been increasingly apparent. In order that our Colonies and Possessions may be placed in a position to compete successfully with foreign countries in the production and marketing of the staples of the tropics, it is of paramount importance that their young men should be afforded opportunities for instruction in the principles of agriculture, and in the cultivation and preparation for market of tropical produce of every kind, including especially sugar and its by-products rum and molasses, cacao, coffee, cotton, coconuts, rice, citrus and other fruits—notably bananas, and dye-woods, many of which commodities constitute the raw materials employed in the manufactures of the Mother Country.

7. Equally important is the need which exists of making full provision for the prosecution of research, and for the training of scientific investigators in matters pertaining to tropical agriculture amid suitable surroundings, and for creating a body of British expert agriculturists well versed in the knowledge of the cultivation of land in the tropics, and of scientific advisers possessing an intimate knowledge of the means of combating pests and diseases the control of which is fundamentally essential to the successful development of agriculture in the tropics.

8. It has been brought before the notice of the Committee that Agricultural Colleges have been established successfully in Porto Rico and Hawaii, besides a University in Louisiana, which possesses, moreover, an unrivalled Sugar School at Audubon Park, New Orleans, and they would regard it as a reproach if Great Britain were to remain behind the United States in this matter. The Committee desire especially to emphasize the fact that the establishment of a Tropical Agricultural College in the West Indies is a matter of Imperial concern. Such a college would be of no less importance to the Mother Country than to the Colonies immediately concerned, having regard to the present necessity of developing production throughout the Empire to the utmost extent, and to the opportunities which it would afford to students

trained in agriculture at Universities in the United Kingdom to continue their training as post-graduates in the tropics.

9. *Situation of the College.*—Sir Leslie Probyn, K.C.M.G., Governor of Jamaica; Major Sir John Chancellor, K.C.M.G., D.S.O., Governor of Trinidad and Tobago; Mr. T. A. V. Best, C.M.G., C.B.E., Colonial Secretary of Trinidad and Tobago, and Mr. P. C. Cork, C.M.G., late Colonial Secretary of Jamaica, attended before the Committee and submitted evidence regarding the claims of their respective colonies to selection as the headquarters of the proposed College. The Committee also had the advantage of perusing a valuable memorandum submitted by Sir Sydney Olivier, K.C.M.G., C.B., late Governor of Jamaica, who, as Secretary of the Royal Commission in 1897, visited all the West Indian islands and British Guiana, and thus has an intimate knowledge of their conditions and requirements.

10. After carefully considering the matter in all its aspects, and with special reference to the geographical position and grouping of the various West Indian islands and British Guiana, and to the general desire that the college should be closely associated with the Imperial Department of Agriculture, the Committee recommend that the Tropical Agricultural College be established in Trinidad, provided that the Government of Trinidad and Tobago is prepared to afford it adequate support and every reasonable facility.

11. In arriving at this decision the Committee were influenced by the fact that Trinidad possesses a wide variety of industries and is easy of access by steamer communication to residents in the neighbouring islands and British Guiana.

12. The Committee recognise that the claims of Jamaica have great weight, this Colony having a population approximating to that of the rest of the West Indian islands, and a still wider variety of industries than that possessed by Trinidad. They feel, however, that difficulties of intercolonial transit would form a serious obstacle to the transfer of the Imperial Department of Agriculture to Jamaica if, as is so much to be desired, the islands of the Lesser Antilles are still to derive immediate advantage from the work of that useful body.

13. Mr. E. A. de Pass strongly urged the claims of Jamaica; but the Committee reluctantly feel that, owing to its geographical position, Jamaica must to some extent be treated as a separate unit in this matter. In view, however, of the great importance of that island's agricultural interests there should, in their opinion, be intimate co-operation between the Jamaica Agricultural Department and the Imperial Department of Agriculture, and the Committee believe that it would be of advantage to Jamaica to identify itself with the proposed Tropical Agricultural College. The Committee further suggest that the usefulness of the organisation at present existing in Jamaica for agricultural training and research might be extended by a modification in the case of that Island of the financial proposals contained in a later paragraph of this Report, so that Jamaica's contribution and the proportion of any Imperial grant added thereto might be divided between the funds of the proposed College and a local Agricultural School.

The claims of Barbados were also closely considered, but could not be entertained owing to the smaller range of that Island's products.

14. *Incorporation*.—It being obviously desirable that the Tropical Agricultural College should, from its inception, be established as a legal entity, the Committee have had under consideration the various means by which this could be effected.

15. They are strongly of opinion that it would add materially to the standing and influence of the College if it were to be incorporated by Royal Charter. They are advised, however, that it will be better to defer petitioning the King for the grant of a Royal Charter until the College has been successfully established with every prospect of permanency.

16. Whilst, therefore, advocating that it should be the ultimate object of the Governing Body of the Tropical Agricultural College to petition His Majesty for the grant of a Royal Charter of Incorporation, the Committee recommend that, at the outset, the College be incorporated in the United Kingdom as a Company limited by guarantee, and that application be made to the Board of Trade for a licence, under Section 20 of the Companies (Consolidation) Act of 1908, whereby the word "Limited" may be omitted from its name.

17. They append to this report documents marked A and B* showing what procedure should be adopted in this connection. In recommending the Incorporation of the College in the United Kingdom, the Committee have not lost sight of the question of possible liability to Income Tax, etc. They are advised, however, that in view of the fact that the objects of the College would be a charitable purpose within the meaning of those words as used in the Income Tax Acts, it would be entitled to exemption from taxation in respect of income derived from any investments representing an endowment fund, and that monies received for expenditure on general purposes would be similarly exempt from Income Tax.

18. *Constitution*.—With regard to the Constitution of the proposed College, the Committee desire to make the following recommendations:—

(1) They regard it as highly desirable that an intimate relationship should be established between the Imperial Department of Agriculture and the Tropical Agricultural College.

After careful consideration, the Committee recommend that in the first instance the Imperial Commissioner of Agriculture be the Principal of the College, and that, when occasion arises for a new appointment, the Trustees and Governors (to be constituted as hereinafter provided for) nominate a Principal and, in consultation with the Secretary of State for the Colonies, arrange that such Principal also holds the position of Imperial Commissioner of Agriculture should the Secretary of State desire to appoint him to that office.

(2) The Trustees and Governors of the College should be a body composed of (a) ex-officio, (b) nominated, and (c) co-opted mem-

* These documents have been omitted in this reprint.

bers, and should constitute a Governing Body whose meetings should ordinarily be held in London.

The Governing Body should administer the affairs of the Tropical Agricultural College, should hold and expend all monies belonging to the College, and should appoint and/or dismiss all officers of the College. They should appoint from their own body a Finance Committee whose meetings should ordinarily be held in London, and should also appoint from their own body an Executive Committee whose meetings should be held in the Colony in which the Agricultural College is situated.

The ex-officio members of the Governing Body should be two in number, namely:

(a) The senior Financial Officer for the time being of the Colony in which the College is situated.

(b) The Principal of the Tropical Agricultural College.

The nominated members of the Governing Body might vary in number, and should include:—

(a) Two members appointed by the Secretary of State for the Colonies, of whom one might ordinarily be able to serve as a member of the Finance Committee and the other as a member of the Executive Committee (to be constituted as hereinafter provided for).

(b) One member appointed by the Academic Board of the Tropical Agricultural College who should ordinarily serve also on the Executive Committee.

(c) A group of members nominated by the contributing Colonies. The number of such Trustees and Governors might vary, but the Committee anticipate that the number might be six, viz., one each nominated from Barbados, British Guiana, Jamaica, Trinidad and Tobago, the Leeward Islands, and the Windward Islands.

(d) A group of members nominated by contributing industries. In this case, again, the number of such Trustees and Governors might vary, but the Committee consider it possible that the number might be five, viz., one each representing the cacao, cotton, coconut, fruit-growing, and sugar industries, respectively.

(e) Three members nominated by and representing Academic Institutions in the United Kingdom. The Committee regard such representation as a matter of the highest consequence, and suggest that, for purposes of nomination, those institutions deemed suitable by the Governing Body be placed on a roster and invited to nominate representatives in such order as they may determine. The Committee further recommend that the three Academic Institutions first invited to nominate each one Trustee and Governor be the University of Cambridge, the University of Glasgow, and the Imperial College of Science and Technology of London.

The co-opted members of the Governing Body should be four in number, of whom two should ordinarily be invited in respect of their ability to serve also as members of the Finance Committee, and the other two in respect of their ability to serve also as members of the Executive Committee.

The Finance Committee should be composed of such Trustees and Governors as the Governing Body determine, and the duties

of the Finance Committee should be defined from time to time by the Governing Body.

The Executive Committee should include the two ex-officio Trustees and Governors of the College, and such other Trustees and Governors as the Governing Body determine, provided always that any member of the Governing Body should be at liberty to attend any meeting of the Executive Committee, and in the event of his being present should be entitled to vote. The duties of the Executive Committee should be defined from time to time by the Governing Body.

The two ex-officio Trustees and Governors should remain members both of the Governing Body and of the Executive Committee so long as they continue to hold the offices in virtue of which they respectively serve.

The four co-opted Trustees and Governors should continue in office for a period of four years only; but it should, nevertheless, be competent for the Governing Body to re-appoint a co-opted member at the expiration of his period of service.

The several nominated Trustees and Governors should continue in office for a period of four years only, subject to the proviso that the odd numbers of those first nominated as Trustees and Governors should be appointed to serve for six years. Except in the case of Academic Institutions in the United Kingdom invited by the Governing Body to nominate representatives, it should be competent for each nominating authority to re-appoint a nominated member at the expiration of his period of service. In the case of Academic Institutions permission to this effect might be granted by the Governing Body.

The normal composition of the Governing Body as suggested may be summarised as follows:—

A. Ex-officio members (also ex-officio members of the Executive Committee)	2
B. Nominated members:—	
Representing the Secretary of State for the Colonies	2
Representing the Academic Board of the Tropical Agricultural College	1
Representing the Contributing Colonies, possibly	6
Representing the Contributing Industries, possibly	5
Representing Academic Institutions in the United Kingdom	3
C. Co-opted Members	4
Total	23

(3) The Academic Board should be composed of the Principal and the Professors of the Tropical Agricultural College, and should have charge of the Students of the College, and be responsible to the Governing Body for the discipline of the Students and for the details of the instruction imparted to them.

(4) The Staff of the College should consist of the Principal, and of such Professors (ex-officio members of the Academic

Board), and Lecturers (who should not be members of the Academic Board), together with other assistants, as the Governing Body from time to time appoint to serve. The Staff should, from the inception of the College, include teachers with the status of Professors in the following subjects:—

1. General Agriculture;
2. Mycology;
3. Entomology;
4. Agricultural Chemistry;
5. Organic Chemistry;
6. Agricultural Bacteriology;
7. Agricultural and Physiological Botany;
8. Genetics;
9. Sugar Technology; and
10. Agricultural Engineering and Physics:

and teachers with the status of Lecturers in the two subjects:—

11. Stock and Veterinary Science; and
12. Book-keeping.

19. In connection with the Staff, the Committee beg to recommend strongly that one of the duties delegated at the outset by the Governing Body to their Finance Committee be that of devising a suitable scheme of pensions for the members of the College Staff; and that one of the duties delegated to their Executive Committee be that of arranging that provision be made for the granting to members of the Staff of periods of Study-leave in addition to any furlough to which, as teachers in the College, they may be entitled.

20. *Curriculum*.—Though they have recommended (*see* Section 18 (3) above) that the details regarding the instruction to be given to Students of the Tropical Agricultural College should be settled by the Academic Board which it is proposed to set up, the Committee submit the following suggestions as to a curriculum, put forward by Sir Francis Watts, K.C.M.G., D.Sc., with the general principles of which they are in agreement:—

“(a) A junior course of instruction in tropical agriculture extending over two, or possibly three, years. This course should be arranged to meet the requirements of youths leaving the Secondary Schools of the colonies who intend to follow ordinary agricultural pursuits, probably in the colonies from which they come. There should be some educational standard of requirement for admission to the course. This might be an examination of the College, or certain recognised examinations might be accepted in substitution, such, for example, as the Senior Local Examination of Oxford or Cambridge, or other similar examinations. This course of instruction should embrace general agricultural science and agronomy, together with such practical instruction in the elements of field agriculture as the equipment of the College permits.

“(b) A senior course of similar instruction extending over not less than four years.

- “(c) A course of two years’ instruction in more advanced tropical agriculture for students who have undergone a course of instruction in general agriculture in a recognized institution, such as a University, a University College, or an Agricultural College. This course would practically coincide with the final two years’ teaching of the last-named course (b).
- “(d) Post-graduate study of special agricultural subjects in their tropical application, as, for example, Entomology, Mycology, Chemistry, Plant Breeding, and the general study of special crops such as sugar, cacao, cotton, coconuts, rice, and a variety of others, to be arranged to meet the requirements of individual students. These studies would be carried on through the College, in association with the Imperial Department of Agriculture, and, by arrangement with the respective Governments, through the medium of such Local Agricultural Departments and Experiment Stations as appear to be particularly suited for the work. It is probable that facilities in connection with these studies may be offered by the owners of sugar and other factories and by the owners of plantations, and that courses of instruction to meet the needs of individual students may be arranged by the Academic Board to meet special cases.”

21. *Sugar School*.—Recognizing the urgent need which exists for the provision of scientific and technical training in sugar manufacture, the Committee strongly recommend that a Sugar School equipped with a complete plant on a small, but working, scale be established in connection with the Tropical Agricultural College. They believe that the leading sugar machinery manufacturing firms would be willing to contribute different portions of this plant.

22. *Oil Technology*.—In view of the growing importance of the oil industry of Trinidad, it has been suggested to the Committee that, in the event of it being decided to establish the Tropical Agricultural College in Trinidad, a technical branch might be added to that institution, where men could obtain practical training in oil technology and the control of oilfields. Students would have exceptional opportunities of acquiring knowledge, inasmuch as they would be able to visit the oilfields periodically, while the presence in the island of many fully qualified engineers, geologists, drillers, etc., would permit of lectures being given from time to time on all subjects associated with petroleum.

23. *Financial Arrangements*.—In approaching the question of way and means, the Committee have had constantly in view the fact that though the Tropical Agricultural College would be located in the West Indies it would be, to a great extent, Imperial in its scope and activities, it being expected, for example, that the senior students would be post-graduates of British Universities and Colleges and that many of the students trained in the College would be available for service throughout the Empire. Apart from this, they would point out that, as stated in an earlier

paragraph of their report (Section 8), it would be manifestly to the benefit of the Mother Country that production should be extended in the British West Indies on scientific and remunerative lines. They would emphasize, moreover, in this connection, that, of the American Agricultural Colleges to which reference has already been made, that of Porto Rico, at any rate, is subsidised by the United States Government. In order to provide the requisite ways and means for the establishment and maintenance of the West Indian Tropical Agricultural College, the Committee recommend that:—

- (1) For the establishment of the College a Fund of £50,000 and upwards should be raised by private subscription.
- (2) For the maintenance of the College—
 - (a) Annual contributions should be invited from the various West Indian Colonies on the basis of the equivalent of, say, $\frac{1}{2}$ per cent. of their average revenue during the preceding three years, and each Colony, in return for its contribution, should have the right to nominate a representative to sit on the Governing Body of the College and to enjoy special privileges in respect of its students; it being understood in this connection that the constituent Islands of the Windward Islands group should be regarded as one Colony.
 - (b) Annual contributions should be invited from the Imperial Government as grants-in-aid, on the basis of £1 for every £1 contributed by the Colonies, the liability of the Imperial Government, however, not to exceed £15,000 in one year.
 - (c) Voluntary contributions should be invited from industrial organisations and individuals interested in tropical industries.

The Committee feel very strongly that the claim for Imperial assistance would be fully justified by reason of the Imperial nature of the work to be undertaken.

They also feel that, if their recommendations meet with your Lordship's approval, it would greatly facilitate the collection of contributions from those interested in tropical industries if your Lordship would yourself issue the appeal.

24. *College Buildings*.—The Committee consider that the question of College Buildings is one which should be remitted to the Governing Body when duly constituted. They would, however, express the hope that the Government of whichever West Indian colony may be selected as the site of the Tropical Agricultural College will meet the Trustees and Governing Body in a liberal spirit in this connection, and they desire to record that they have already received a generous offer of accommodation on a substantial scale from the Governor of Jamaica. It need hardly be added that the Committee attach the greatest importance to the buildings being erected in healthy surroundings and on thoroughly hygienic lines.

25. *Imperial Department of Agriculture*.—Having regard to their recommendation that the Tropical Agricultural College

should be closely associated with the Imperial Department of Agriculture, the Committee consider it as within their terms of reference to emphasize, as they desire most earnestly to do, the importance of establishing that Department on a more permanent basis after the expiration of the present Imperial grant.

26. The Committee wish in conclusion to express their obligation to Mr. Algernon E. Aspinall, C.M.G., B.A., for his services as their Honorary Secretary, and for the great assistance which he has given them in their work.

We have the honour to be, My Lord,

Your Lordship's obedient servants,

A. E. SHIPLEY (Chairman).

D. PRAIN.

NORMAN LAMONT.

ERMINE MURRAY (for Gideon Murray).

OWEN PHILIPPS.

FRANCIS WATTS.

EDWARD DAVSON.

A. ABBOTT (for Sir H. Frank Heath).

C. A. BARBER.

R. RUTHERFORD.

H. A. TROTTER.

E. A. DE PASS.

J. BRETLAND FARMER.

ARTHUR W. HILL.

W. H. HIMBURY.

JOHN W. McCONNEL.

GEO. MOODY STUART.

ALGERNON E. ASPINALL,

Hon. Secretary,

22nd October, 1919.

After this report had been approved the Committee held a further meeting to consider the following cablegram received on November 5th, by Mr. E. A. de Pass, from Mr. A. W. Farquharson, Chairman of the Jamaica Imperial Association:—

“Financial majority Elected Members agree support initial grant £50,000 and £5,000 annually towards the Agricultural College if Jamaica made headquarters Imperial Department of Agriculture.—FARQUHARSON.”

The Committee, whilst adhering to the recommendations contained in their report, suggest that, in the event of Trinidad and the Windward and Leeward Islands not seeing their way to support adequately the proposed Tropical Agricultural College—a contingency which the Committee hope may not arise—the possibility of establishing the College in Jamaica may again be considered. The question as to the site of the Imperial Department of Agriculture does not come within the terms of reference to

the Committee, although they have found it necessary in the course of their report to refer to this important aspect of the question.

ALGERNON E. ASPINALL,
Hon. Secretary.

25th November, 1919.

XII.—THELLUNGIA, A NEW GENUS OF GRAMINEAE.

O. STAFF.

About a year ago Dr. Thellung, of Zürich, submitted to Kew a grass which had sprung up among the wool refuse of the worsted mill, Derendingen, near Solothurn (Switzerland). It was first observed in 1907, in some young specimens which flowered only imperfectly. One of these was submitted to Professor Hackel, who very hesitatingly suggested that it might be a species of *Ectrosia*. As such ("*Ectrosia? mutica*, Hackel ad int.") it was enumerated by Probst in his paper "Die Adventiv- und Ruderalflora von Solothurn und Umgebung" in *Mitteil. naturforsch. Ges. Solothurn*, 5. xvii. Ber. 1911-1914, p. 164 (1914), but without a description being given. An attempt made then by Drs. Thellung and Probst to grow it in a pot failed, and it was not until 1918 that good flowering specimens presented themselves in the same locality where the plant had been found originally. The preceding summer (1917) having been very hot it is not improbable that the grass was thereby stimulated to more active growth and ample flowering.

The rich alien flora around the Derendingen mill includes numerous grasses of Australian origin. An analysis of the grass soon showed that it could not be an *Ectrosia*, nor did a prolonged search among the Australian grasses lead to its identification. Argentina and South Africa were suggested as likely native countries, but with no better result. Fortunately the condition of the specimen was good enough to allow of a very complete examination of the floral structure, which was found to be very like that of a *Sporobolus*, but distinguished by the presence of several (mostly three and sometimes four) florets in each spikelet. Moreover the disposition of the spikelets in the inflorescence proved to be different. The very close relationship of *Sporobolus* and *Eragrostis* demanded comparison with the latter, and some of its closer allies as *Leptochloa* and *Diplachne*; but the strictly 1-nerved delicate valves coupled with the free pericarp of the grain excluded those genera and led again back to *Sporobolus*. Now *Sporobolus*, as we understand it at present, is a well defined and uniform genus which although rich in species has practically no synonymy that would throw doubt on its homogeneity. One of its salient characters is the presence of only one floret in each spikelet and the discontinuation of the rachilla above it. As to the latter, we know at present only of one clear exception, viz. *S. subtilis*, a Madagascar species, and as to the increase in

the number of florets the cases quoted in Bentham and Hooker's *Genera Plantarum* (*S. compressus* and *S. serotina*) and in Martius's *Flora Brasiliensis* (*S. ramosissima*) concern only individual spikelets in otherwise normal inflorescences and seem to be altogether rare. I myself have seen 2-flowered spikelets only in a specimen of *S. compressus* which was attacked by some fungal disease. Instances of a similar exceptional addition of florets occur in *Panicum*, *Andropogon* and *Oryza*, genera with an otherwise perfectly stereotyped number of florets, and they have never been considered to affect the character of those genera. However close the spikelets of the Derendingen grass may approach those of *Sporobolus* in the structure of the parts, they contrast so decidedly in the number of florets that to include the grass in *Sporobolus* would vitiate our well established conception of that genus. This contrast is moreover enhanced by the grouping of the spikelets in pairs on the somewhat distant spike-like and themselves spicate branches of the inflorescence, a disposition not known in *Sporobolus*. Thus the Derendingen grass appears to represent a type concurring in many ways with *Sporobolus*, yet clearly and discontinuously detached from it in other respects, and this condition will be best expressed by conceding generic rank to the new type and placing it next to *Sporobolus*. The fact that it grew among a considerable number of aliens of Australian origin renders it highly probable that this grass too came from the same source. The following is a technical description of the new genus and of its only species. The genus has been named *Thellungia* in acknowledgment of the excellent work Dr. Thellung has done in connection with the adventitious flora of Europe.

Thellungia, Stapf [Gramineae-Sporoboleae] gen. nov.; affine *Sporobolo*, sed spiculis 3-4-floris bene distinctum.

Spiculae lateraliter compressae, per paria in ramis brevibus paniculae fere spicam compositam referentis subsessiles, imbricatae, continuae cum pedicellis; rhachilla tarde disarticulata supra glumas et inter anthoecia, glabra, paululo ultra basin anthoecii summi producta. *Anthoecia* 3-4, omnia ♂. *Glumae* 2, delicate membranaceae, subaequales, 1-nerves, tenuiter carinatae. *Valvae* glumis simillimae, nisi superiores breviores. *Valvulae* quam valvae conspicue breviores, tenuiter 2-carinatae, inter carinas subplicatae. *Lodiculae* 2, late cuneatae, carnosae. *Stamina* 3. *Ovarium* glabrum; styli perbreves, terminales; stigmata plumosa, breviter. *Caryopsis* libera, nuda cadens ut videtur; pericarpium tenue, siccum semini adpressum, humefactum expansum, semen more utriculi circumdans. *Semen* a latere compressum, sectione transversa cuneatum; hilum punctiforme, basale. *Embryo* ad medium semen attingens.—Gramen gracile, perenne; foliorum laminae angustae, vervatione convolutae; ligulae ad marginem ciliolatum redactae. Inflorescentia angustissima; rami solitaria, e basi floriferi, axi communi subadpressi et eius internodiis paulo longiores vel superiores breviores et magis appressi. Spiculae nitentes, mediocres.

Species unica, verosimiliter Australiensis.

T. advena, Stapf. *Gramen* glaberrimum, inflorescentia inclusa ultra 5 dm. altum; innovationes intravaginales, basi paululo bulboso-incrassatae et pallidae, 5-6-foliatae. *Caules* tenues teretes, circa 4-nodi, nodis exsertis. *Foliorum* vaginae teretes, arctae, tenuissime striatae; laminae anguste lineares, longe apicem versus attenuatae, acutae, ad margines superne scaberulae, caeterum laeves, pallide virides, ad 12 cm. longae, ad 2.5 mm. latae, summa basin inflorescentiae longe excedens, costa nervisque lateralibus approximatis tenuibus. *Inflorescentia* fere epedunculata, basi in vagina summa inclusa, tota ad 25 cm. longa; rami infra medium siti circiter 1.7-1.4 cm. longae, superiores sensim breviores. *Spiculae* plerumque 4 mm. longae, pallide virescentes, hincinde leviter purpureo-suffusae, imperfecte apertae; una uniuscuiusque paris brevissime, altera longius pedicelatae vel utraque subsessilis; rhachilla flexuosa. *Glumae* hyalinae, albiae, perangustatae, lineari-lanceolatae vel lineares. inferior acute acuminata, superior obtiuscula, utraque superne in carina viridi asperula. *Valvae* glumas paulo excedentes, glumae inferiori simillimae, nisi inferne paululo latiores et minus acutae, sursum descrentes, 4-2.5 mm. longae. *Valvulae* valvae $\frac{1}{2}$ aequantes, in dorso curvatae, carinis viridibus superne minute scaberulae. *Lodiculae* 0.25 mm. longae. *Antherae* breves, oblongae, 0.3-0.4 mm. longae; filamenta 0.6 mm. longa. *Styli* 0.2 mm. longi; stigmata 0.6 mm. longa. *Caryopsis* oblonga, stylopodio paulo incrassato coronata, ad 1 mm. longa, albo-viridula. *Semen* pallidum, 0.8 mm. longum, 0.3-0.35 mm. latum, 0.15 mm. crassum. *Ectrosia?* *mutica*, Hack. ex Probst in Mitteil. d. naturforsch. Ges. Solothurn, 5, xvii. Ber. 1911-1914, p. 169 (1914), nomen tantum.

SWITZERLAND. An alien grown from wool refuse at Derendingen Mill, near Solothurn, Probst, 1918.

As the filaments grow never beyond the stigmas, the small anthers are more or less in contact with them, and as moreover the florets appear to open very imperfectly, autogamy would seem to be ensured, and even cleistogamy may occur; but I have seen the tips of stigmas protruding laterally from the florets, so that xenogamy is not altogether excluded. The pollen grains measure about 25 μ in diameter and may be seen sending out their pollen tubes among the stigmatic hairs.

While this article was going through the Press a copy of Dr. Probst's *Zweiter Beitrag zur Adventiv- und Ruderal-flora von Solothurn und Umgebung* (in Mitteil. naturf. Ges. Solothurn, 6, xviii. Ber. 1914-1919) was received, containing a reproduction of an excellent photograph of the grass in $\frac{1}{2}$ nat. size. This shows the grass forming a compact tuft and about 5 dm. high including the inflorescence. This agrees with the specimen examined. On the other hand the inflorescences shown in the photograph are only 12-14 cm. long with the branchlets tightly appressed to the axis, forming a false spike of not more than 3 mm. in diameter, whilst the largest of the leaves is 18 cm. by 4.5 mm. The illustration is intended to accompany the enumeration of *Thellungia advena*, Stapf, gen. et spec. nov. on p. 17.



1. Inflorescence and barren shoot (nat. size). 2. Branch of inflorescence, 3 x. 3. Spikelet. 4. Lower glume. 5. Upper glume. 6. Upper floret (one half of valve removed). 7. Flower with one half of valvule. 8. Lodicule, 35 x. 9. Ovary, after flowering. 10. Grain, cut open, to show the loose seed inside. 11. The same, cross section. All other figures x 15.

XIII.—QUERCUS AEGILOPS.

C. C. LACAITA.

The generally recognised identity of *Quercus Aegilops* L. with the Vallonea*, or Valonia, oak of Greece and the Levant has recently been doubted for the reason that Linnaeus calls the leaves glabrous and assigns Spain, where the Vallonea does not grow, as the habitat of his species. The latter doubt derives some additional support from the fact that the two sheets in the herbarium marked *Aegilops* in Linné's own hand are unquestionably *Q. faginea* Lam., and at least one of the two was sent by Baron Alstroemer from Spain, as appears from the letter A written close to the specimen by Linnaeus. But he did not receive these specimens till long after the publication of the *Species Plantarum* in 1753; so they do not account for the habitat "Hispania."

I am afraid that we shall have to admit that Linnaeus never saw the Vallonea oak, whether alive or in herbarium specimens, and that in compiling an account of the species—*more suo*—from earlier writers he overlooked the admirable description in Tournefort's *Voyage* and even that in Miller's *Figures of Plants*, whilst copying an earlier mistake of Miller's and adding one of his own as to the glabrous leaves. Nevertheless, there is good justification for using the name *Quercus Aegilops* L. as a comprehensive term for the oak which supplies the Vallonea of commerce, without attempting to restrict it to any one of the more specialised forms of the trees that furnish that article, such as *Q. macrolepis* Kotschy, *Q. graeca* Kotschy, etc., whatever may be the systematic value of those forms, for the simple reason that neither Linnaeus nor the earlier authors were aware of these distinctions, and that Linnaeus did not have any one of them before his eyes.

The interpretation of Linnean names in the *Species Plantarum* is based on several elements:—

- (1) The diagnosis and observations.
- (2) The synonyms quoted.
- (3) The habitat assigned.
- (4) The specimens in the Linnean herbarium.
- (5) His own earlier work; the *Hortus Cliffortianus*.
- (6) The specimens of the Hort. Cliff. in the British Museum.

* Vallonea, usually spelled Valonia by English authors, is the trade name under which the acorns and cups of this oak come from Albania, Greece and the Levant. The origin of the name is disputed. I am inclined to think that the form Valonia is derived, as usually supposed, from *βάλανος*, the old Greek word for acorn, which in modern Greek has become *βαλάνι* or *βαλανίδι* (the tree being *βαλανιδιά* or *βελανιδιά*), names which appear as Velani and Velanida etc. in the accounts of western travellers. On the other hand Parmigiani, *Vocab. Etimol. della Lingua Italiana*, rejects any connection of the name Vallonea with *βάλανος*, and in that form it more probably comes from the Albanian town of Vallona, which is a centre of export. The Vallonea oak is plentiful in the district and is called Vallanít. It is tempting to connect the name of the town also with *βάλανος* but this will not do, for Vallona is only the Italian corruption of Avlona, the ancient name being Aulon (*Αὔλων*) not Apollonia, as supposed by Ray, *Hist.* p. 1387. Apollonia was a different place, also in Albania, but inland, some distance north of Vallona, at a spot now known as Pollona or Pollina.

In the present case nos. 5 and 6 fail us for there is no reference to *Q. Aegilops* in the Hort. Cliff. The definition in Sp. Pl. (1753), p. 996, is *Q. foliis ovato-oblongis glabris serrato-repandis*, repeated in ed. 2 (1763), p. 1414, with the alteration of *serrato-repandis* to *serrato-dentatis*. In both editions follows "nascitur calyce maximo." The habitat assigned is *Hispania*. The synonyms are in ed. 1: (1) *Quercus calyce echinato, glande majore*. Bauh. Pin. 420; (2) *Cerri glans Aegilops aspris* Bauh. hist. i. p. 77 *fructus*. It is important to note that the reference to J. Bauhin's *Historia* is limited to the *fructus*. The second edition, whilst repeating these two synonyms, adds Mill. Dict. t. 215 to the diagnosis, as if that diagnosis were Miller's, whereas it is Linné's own, including the alteration to *serrato-dentatis*.

Now although the diagnosis by itself is utterly insufficient for any possible identification, the observation "calyce maximo" at once narrows the field to the Vallonea and some similar oaks, excluding all oaks that grow in Spain, but agreeing with the synonyms, which, as will appear, undoubtedly refer to the Vallonea. On the other hand, "foliis glabris" either excludes the Vallonea, or must be neither more nor less than a mistake on the part of Linnaeus. The leaves of Vallonea oaks, though glabrous, or almost, on the upper surface, are invariably pubescent beneath. Miller, Gard. Dict. ed. vii. (1759), says "leaves on their underside a little downy" and in Fig. Pl. (referred to by Linnaeus for the figure), "covered on their under side with an almost imperceptible hoary down." These remarks should have called Linné's attention to the matter in his second edition, though of course they were not before him when he wrote "glabris" in the first. Martelli in Nuov. Giorn. Bot. It. xx. p. 428 (1888) suggests that *Q. Libani* Olivier, which has glabrous leaves, and especially its var. *callicarpa* Kotschy, should be regarded as the type of *Q. Aegilops* L. But there are fatal objections to this proposal; there is no evidence that Linnaeus had ever seen or heard of the *Libani* oak; it does not remove the difficulty of the supposed Spanish habitat; and the ordinary Vallonea acorn or cup of commerce, on which the earlier synonyms of Linnaeus were based, comes from countries where *Q. Libani* does not grow. I have failed to trace any passage in the earlier authors which could have suggested to Linnaeus that unfortunate "foliis glabris," and have little doubt that he was only speaking of the upper surface and did not in 1753 know anything about the lower surface.

The reference to Miller's *Figures of Plants* is all-important. The plate in question, drawn by his brother-in-law Ehret, bears the date of 21st February, 1758, though the title-page of the volume is dated 1760. It is quite a good representation of the Vallonea oak with unripe acorns. No doubt the sharply serrated leaves of this figure were what induced Linnaeus to alter his description of him in Sp. Pl. ed. 2. The text, vol. ii. p. 143, states clearly that the tree grows in the Levant, and is practically identical with the account of it in Gard. Dict. ed. vii. (1759), repeated almost verbally in ed. viii. (1768).

Miller knew this oak well. He declares (Fig. Pl. loc. cit.) that the greater part of the trees then in England had been raised in

the Chelsea Garden in 1748. It appears in the first edition of the Gardener's Dictionary of 1731 as *Quercus* (no. 5) *calyce echinato, glande majore* C. B. P., and is alleged to have been originally brought to England from Spain. This, of course, is a mere mistake of Miller's. He was not infrequently mistaken as to the origin of seeds he received. He adds, "this is preserved by such as are curious in the collecting the several kinds of trees," words which seem to imply that he did not himself possess it at Chelsea at that date; therefore we cannot be sure that Aiton, Hort. Kew. iii. p. 359 (1789), and Smith, Rees' Cyclop. xxix. (1819), are correct in their statement that Miller had grown the Vallonea in 1731, a statement which seems to rest on this passage in the dictionary. The identical words of the 1731 edition are repeated in all subsequent editions up to and including the sixth of 1752, which is the latest that Linnaeus could have seen before the Species Plantarum of 1753.

Linnaeus probably adopted from Miller's early editions the grave error as to the native country of *Aegilops*, which, in addition to the "*foliis glabris*," led to his false determination of the (fruitless) specimens in the herbarium, but it is strange that he should not have also followed Miller in the correction of the mistake, which was made in the interval between the first and second editions of the Species Plantarum, for in the seventh edition of the Gardener's Dictionary (1759) all is changed. No. 5 of the earlier editions becomes no. 9, "*Quercus foliis ovato-oblongis glabris, serrato-repandis* Lin. Sp. Plant. 996. *Q. calyce echinato, glande majore* C. B. P. 420. The ninth sort grows naturally in the *Levant*, from whence the Acorns are annually brought to *Europe*, where they are used for dyeing; these are called *Velani*, and the tree *Velanida* by the *Greeks*. It is one of the fairest species of oaks in the *World* . . . The Acorns have very large scaly Cups, which almost cover them; the Scales are ligneous and acute-pointed, standing out a quarter of an inch; some of the Cups are as large as middling Apples. The leaves are stiff, of a pale green on the upper side, and on the under side a little downy."* No allusion to Spain; no apology for the previous mistake, possibly out of regard for Linnaeus, who had fallen into the same error.

How, then, came Linnaeus to overlook this admirable account in his second edition, where he actually quotes Miller's figure? I can only suggest that he had just received the specimens from Alstroemer, who was in Spain between 1760 and 1764, and having labelled these, in the absence of fruit, *Aegilops*, took them as evidence that *Aegilops* really grows in Spain.

Smith rightly referred the two specimens to *Q. faginea*, writing on the sheets, *more suo*, "*Nequaquam; faginea ex descr. Willd.*

* It seems incredible that in the face of this description Rouy, Fl. Fr. xii. p. 314, should have made such a serious mistake as to quote "*Q. Aegilops* Mill. Dict. ed. vii. no. 7, non. L." as synonymous with *Quercus lanuginosa* Thuill. = *Q. pubescens* W. Apart from the wrong identification, he seems unaware that the 7th edition of the Gardener's Dictionary employs no binomials, which were not adopted by Miller before the 8th ed. of 1768. M. Rouy cannot have looked at the Dictionary which he professes to quote; nor is this the only instance of his misinterpretation of Miller.

no. 68." He repeats this determination in Rees' Cyclopædia under *Q. faginea*. One of the specimens is figured by Loudon in Arb. & Frut. Brit. iii., p. 1926, fig. 1816, to represent *Q. faginea* Lam. They seem to correspond admirably with Cavanilles' plate of *Q. valentina*, Ic. ii. t. 129 (1793), identified by Willkomm in Prodr. Fl. Hisp. i, p. 240, with *Q. faginea* Lam. (1783). This plate shows how very unlike the acorns of *faginea* are to those of the Vallonea.

The eighth edition of the Gardener's Dictionary (1768) merely repeats what had been said in the seventh, only adopting the Linnean binominal *Quercus Aegilops* and altering *dentato-repandis* to *dentato-serratis* in accordance with the second edition of the Species Plantarum.

All modern authors who carry weight, such as Smith in Rees' Cyclop. xxix, Hooker in Trans. Linn. Soc. xxiii. p. 384 ("On three Oaks of Palestine"), and Boissier, Fl. Or. iv. p. 1171, adopt the identification of *Q. Aegilops* L. with the Vallonea without discussion or reference to the herbarium specimens. A. de Candolle, Prodr. xvi. i. p. 45, considers the Linnean name to include *Q. macrolepis* Kotschy and *Q. graeca* Kotschy, as well as *Q. Vallonea* Kotschy of the Taurus; all these producing the Vallonea acorns of commerce, but he is wrong in excluding from this interpretation the old synonyms relied on by Linnaeus. Solander, too, in his MSS. in Mus. Brit., vol. xix., p. 317, in a description of the species remarks, "*Q. Aegilops* Sp. Pl. 1414 exclusis synonymis praeter Milleri." Probably this hesitation as to the old synonyms (which can mean nothing else than the Vallonea) was due to the fact that the early authors, and especially Jean Bauhin, though not Caspar, mixed up the Vallonea and the Turkey oaks as forms of "*Cerrus Plinii*." Linnaeus probably adopted the name *Aegilops* from our old botanists rather than directly from Pliny. It is a transliteration of the *αἰγίλωψ* of Theophrastus, the identity of which need not be discussed here, because it is from Pliny, not Theophrastus, that our early botanists, ignorant of Greek, took their notions, often misunderstanding even Pliny, as they seem to think that he speaks of *Aegilops* as a kind of *Cerrus*. He does nothing of the sort. What he says is (Hist. Nat. xvi. 8), "*Glandem . . . ferunt quercus, aesculus, cerrus, ilex, suber . . . glans optima in quercu . . . cerro tristis, horrida echinato calyce, ceu castaneae.*" The comparison of the chestnut shows that his *Cerrus* was *Q. Cerris* L., and could not be, or include, the Vallonea. Pliny evidently knew these five acorn-bearing trees as natives of Italy, but *Aegilops* is only introduced later in the same chapter in the words of Theophrastus, "*excelsissima autem aegilops, incultis amica,*" without being connected in any way with the five previously mentioned acorn-bearers; indeed, Pliny only seems to have known it through the Greek author. In c. 13, speaking of parasitic growth, he returns to *Aegilops* only to translate that author's account of the lichens that *αἰγίλωψ* bears.

The earliest account of the Vallonea (*Aegilops*) and Turkey (*Cerris*) oaks as distinct seems to be in Lobel, Stirp. Obs., p. 584 (1576), where the two woodcuts very fairly represent the difference in the acorns, but the leaves of both are shown as identical.

The same woodcuts, as usual with all those that issued from Plantin's Antwerp press, are repeated in Lobel's later books, in Dodoen's *Pemptades* (1583), and even in Parkinson's *Theatrum* (1640). Dodoens follows Lobel's distinction of the two oaks, but Dalechamp, *Hist. Plant.*, p. 6 (1587), again confused them—although Lobel says that he had been taught by Dalechamp—as “*Aegilops Idaeorum, Latinorum Cerrus, Italorum Cerro, Gallis ignotum arbor.*”

To come to the two Bauhins: Caspar in 1623 (*Pinax*, p. 420) distinguishes quite clearly between his *Quercus vi.* and his *Quercus vii.* No. vi. is “*echinato glande majore*” with synonyms “*Cerris Plinii majore glande Lob.*” and “*Aegilops sive Cerris majore glande Dod.*”, and the remark, “*hisce glandibus ad pannos atro colore inficiendos gallorum vice utuntur,*” which fixes the species with certainty as the *Vallonea*. No. vii. “*calice hispido glande minore = Aegilops minore glande Dod. = Cerris Plinii minore glande Lob. = species quae in Etruria Farnia Caesalp.*” is with equal certainty *Q. Cerris* L., the Turkey oak.

Jean, on the contrary, *Hist. Plant.* i. pt. 2, p. 77 (1650), again mixes up the two trees, repeating Dalechamp's, not Lobel's, woodcut, and remarking that he cannot quite understand the passage in Lobel. But the single acorn, which alone is relied on by Linnaeus, who has so carefully said “*fructus*” in quoting this author, is plainly that of the *Vallonea*. It is, therefore, clear that the Bauhin synonyms should not, any more than that of Miller, be excluded from those of *Q. Aegilops* L.

Tournefort seems to be the first western traveller who has described the *Vallonea* oak in its native country. He says (*Voy.* i. p. 334 (1717)) that in the island of Zia (Ceos) “*on recueille beaucoup de Velani (which name he derives from βάλανος); c'est ainsi qu'on appelle le fruit d'une des plus belles espèces de Chêne qui soit au monde,*” and gives a full and excellent account, quoting as its name *Quercus calyce echinato, glande majore* C. B. P. The export of “*Valanea*” from Smyrna is mentioned by Pococke, *Descrn. of the East*, ii. 2, p. 38 (1745), and Olivier, *Voy. dans l'Empire Othoman* (1801), has a good plate (*Atlas tab. xiii.*) by Redouté of a branchlet and acorn. In vol. i. p. 254, he says, “*les Grecs modernes nomment vélani (de βάλανος gland) et les botanistes Quercus Aegilops le chêne qui fournit la vélanide.*”

Elwes and Henry, *Trees of Great Britain*, v. p. 1271, whose plate no. 322 shows the *Aegilops* at Lyndon Hall, Rutland, the finest in England, give statistics of the export of *Vallonea* from Greece, and state on the authority of Mr. Wood, for many years British Consul at Patras, that in that district only the cup is sent when the acorn is ripe, but that “*camata*” and “*camatina*” are unripe fruits esteemed for their colour. Mr. Wood has kindly sent me the following further details. The word “*camata*” is derived from χάμου (*χαμαί* in literary and ancient Greek), “*on the ground,*” meaning the acorns with their cups that are gathered off the ground after they have dropped from the tree. The diminutive “*camatina*” is applied to the unripe fruit gathered from the tree at an earlier stage. *Camatina* in trade commands a higher price, being more effective for dyeing and tanning. The

value of Vallonea, which at one time varied between £20 and £25 per ton, fell to such an extent during the years before the war that export—from Patras, at any rate, had almost ceased, but during the war the price rose again.

Lobel, loc. cit., fancied that he had seen the Vallonea oak in central Italy; “*hujus speciei observasse memini publica via qua itur Pesaro Romam.*” His memory deceived him; he can only have seen the Turkey oak there (or possibly *Q. pseudosuber*), as is pointed out by the accurate Ray, Hist. ii. p. 1387 (1688), who knew that tree in Italy, whereas he had only seen the acorns of the Vallonea at Venice, imported from Vallona.

The only spot in Italy where the Vallonea oak has any claim to be indigenous is near Tricase, in the extreme heel, where a fine group on the steep coast of the Adriatic has every appearance of being native, but as it is quite isolated, one cannot feel sure that it was not planted of old.

XIV.—THE GENUS ROSMARINUS.

W. B. TURRILL.

The genus *Rosmarinus* is limited to the Mediterranean Region, where it occurs in the southern parts of the European countries bordering this sea, in North Africa and as far east as Cyprus, the Troad, and also Cilicia, according to Boissier, Flora Orientalis, vol. iv. p. 636. Most systematists have limited the genus to one species, namely, *Rosmarinus officinalis*, L., although about twelve plants have been given specific rank by various authors. The following revision of the genus is based mainly on the excellent material preserved in the Kew Herbarium.

Rosmarinus, L., Gen. Pl., ed. v. p. 14, n. 38 (1754); Benth. Gen. et Spec. Labiat. p. 314 et in DC. Prod. vol. xii. p. 360; Benth. et Hook. f., Gen. Plant., vol. ii. p. 1197; Briquet in Engler u. Prantl, Pflanzenfam., 3 A. p. 216.

Rosmarinus officinalis, L., Sp. Pl., ed. 1, p. 23 (1753); Briquet, Les Labiées des Alpes Maritimes, p. 179 (1891).

This species is the common rosemary and may be subdivided as follows:—

var. *genuina*, Turrill, var. nov. *Fruticulus* erectus, usque ad 6–10 dm. altus, ramosus. *Folia* linearia, saepissime circiter 2–3 cm. longa, margine revoluta, subtus tomentosa. *Inflorescentiae* 1–2 cm. longae, pulverulentae vel subtommentosae vel subglabrae; bracteae lanceolatae vel lanceolato-ovatae; pedicelli circiter 3 mm. longi. *Calyx* campanulatus, circiter 5 mm. longus, glandulis sessilibus instructus, puberulus vel breviter tomentosus. *Corolla* circiter 1 cm. longa vel major.



Distr. Portugal, Spain, Balearic Islands, South France, Italy, Sicily, Malta, Dalmatia, Croatia, Istria, Switzerland, Greece, Crete (ex Halácsy, *Conspect. Fl. Graec.* vol. ii. p. 491), Macedonia (probably an escape from cultivation), Canaries, Azores, Madeira, Cyprus, Troad, Cilicia (ex Boissier, l.c.), Tunis, Egypt (ex Muschler, *Man. Fl. Egypt*, vol. ii. p. 829—var. *pubescens*, Pamp. ?).

forma **erectus**, *Pasq.* ex Bég. in Fiori e Paoletti, *Fl. analit. d'Italia*, vol. iii. p. 14 (1903). Suffrutex erectus.

Distr. As for the var. *genuina*.

forma **humilis**, *Ten.*, *Syl. Fl. Neapol.* p. 16 (1831); forma *procumbens*, *Pasq.*, *Fl. Vesuviana*, p. 79 (1869); var. *prostratus*, *Pasq.* in *Cat. del Real Ort. Bot. di Napoli*, p. 91 (1867); var. *rupestris*, *Pasq.* ex Bég. l.c. Suffrutex prostratus, ramis diffusis.

Distr. Italy, and probably elsewhere.

forma **albiflorus**, *Bég.* l.c. Corolla alba.

Distr. Italy, and probably elsewhere.

var. **rigidus**, *Car. et Saint-Lag.*, *Etude des Fleurs*, p. 657 (1889); Rouy et Fouc., *Fl. de France*, xi. p. 249 (1909). *R. rigidus*, *Jord. et Four.*, *Brev. pl. nov.*, fasc. i. p. 43 (1866). Suffrutex robustus, caulibus rigidis, ramis erectis, foliis plus minusve erectis virentibus, corolla grandiuscula.

Distr. Southern France, Italy, Spain.

var. **angustifolius**, *Guss.*, *Syn. Fl. Siculae*, vol. i. p. 20 (1842); *R. angustifolius*, *Mill.*, *Dict.*, ed. 8, no. 1 (1768); var. *angustissimus*, *Fouc. et Mand.* in *Bull. Soc. Bot. Fr.*, vol. xlvii. p. 95 (1900); Rouy et Fouc. l.c. *R. tenuifolius*, *Jord. et Four.*, l.c. Suffrutex erectus, foliis patulis tenuibus circiter 1 mm. latis obscure virentibus, corolla grandiuscula.

Distr. Southern France, Italy, Corsica.

var. **latifolius**, *Bég.* l.c. *R. latifolius*, *Mill.*, l.c. no. 2; Rouy et Fouc. l.c. *R. flexuosus*, *Jord. et Four.*, l.c. p. 44. Suffrutex caulibus flexuosis, ramis patulis contortisque, foliis patulis latiusculis margine vix revolutis.

Distr. Southern France, Italy.

var. **pubescens**, *Pamp.* in *Bull. Soc. Bot. It.*, 1914, p. 16 et Pl. Tripolit., p. 16 (1914). I have not seen this plant, but the original description is as follows: Inflorescentiae dense pubescentes, nec puberulae ut in typo et varietatibus nonnullis nec tomentoso-villosae ut in var. *lavandulaceo* (*R. lavandulaceus*).

Distr. Tripoli: Mesellata, Tarhuna, Gariau (ex Pampanini).

forma **roseus**, *Pamp.*, l.c. Flores rosei.

Distr. Tripoli: Tarhuna (ex Pampanini).

Rosmarinus laxiflorus, *de Noé* in *Balansa*, *Pl. d'Algerie*, in 1852, no. 443 (with printed Latin description); *Lange*, *Pug.*, p. 178 (1863); *Willkomm et Lange*, *Prod. Fl. Hisp.* vol. ii. p. 419 (1870). *R. officinalis*, var. *laxiflorus*, *Munby*, *Cat. Pl. Alg.*, 1859, p. 24; ed. 2, 1866, p. 27; *Battandier et Trabut*, *Fl. de l'Algerie*.



Suffrutex prostratus, ramis plus minusve contortis. *Folia* linearia, circiter 1.6 cm. longa et 2 mm. lata, margine revoluta. *Inflorescentiae* 2-3 cm. longae, laxiflorae; bracteae ovatae, apice acuminatae, 1.5 mm. longae; pedicelli 5 mm. longi. *Calyx* campanulatus, 4 mm. longus, leviter puberulus et glandulosus. *Corolla* 7-8 mm. longa.

Distr. Algeria: Santa Cruz, Oran; Djebel-Santo, Oran.

Spain: Cordoba; Cartagena (ex Willkomm et Lange, l.c.).

Rosmarinus lavandulaceus, de Noé in Balansa, Pl. d'Algerie, 1852, no. 444 (with printed Latin description); Debeaux in Mém. Assoc. Franç. avanc. sci. Oran, 1888, p. 312. *R. officinalis*, var. *lavandulaceus*, Munby, Cat. Pl. Alg., 1859, n. 24; ed. 2, 1866, p. 27; Battandier et Trabut, l.c., p. 690 (1890); Debeaux, Fl. de la Kabylie, p. 293 (1894).

Suffrutex prostratus (?). *Folia* 1.5 cm. longa vel minora, 1 mm. lata, valde revoluta. *Inflorescentiae* compactae, multiflorae, 2.5-3.5 cm. longae; bracteae subrotundae, 2 mm. longae, acutae; pedicelli usque ad 3 mm. longi. *Calyx* tubulosus, 4 mm. longus, dense albo-tomentosus et pilis longis tenuibus glandulosis instructus. *Corolla* 1 cm. longa.

Distr. Algeria: plain of Andalous, near Oran; Cape Falcon, near Oran; Arzew, east of Oran; Colesh.



R. lavandulaceus.



R. Tournefortii.

Rosmarinus Tournefortii, de Noé ex Battandier et Trabut, Fl. de l'Algerie, p. 690 (1890), nomen; *R. officinalis*, var. *Tournefortii*, de Noé in Billot flor. gall. et germ. exsic. no. 2124; *Rosmarinus eriocalix*, Jord. et Four., Brev. Pl. Nov., fasc. i. p. 44 (1866).

Suffrutex subprostratus, ramis contortis. *Folia* 1.5-2 cm. longa, 2 mm. lata, margine valde revoluta. *Inflorescentiae* usque ad 3.5 cm. longae, breviter pubescentes et pilis longis apice glandulosis instructae; bracteae late ovatae, apice obtusae vel abrupte breviterque acuminatae, 3 mm. longae; pedicelli usque ad 5 mm.

longi. *Calyx* tubulosus, 6 mm. longus, breviter pubescens et pilis distinctis tenuibus glanduloso-capitatis praeditus. *Corolla* 1.2 cm. longa.

Distr. Algeria: Sidi-bel-Abbis, near Oran; Sehdon, near Oran; Mettili.

According to Captain Hilton-Simpson the Arabic name for this plant is Khlil.

XV.—DECADES KEWENSES

PLANTARUM NOVARUM IN HERBARIO HORTI REGII
CONSERVATARUM.

DECAS XCVI.

951. *Miliusa dolichantha*, Craib [Anonaceae-Miliuseae]; a *M. Roxburghiana*, Hook. f. et Thoms., foliis subtus molliter pubescentibus, alabastris elongatis angustis distinguenda.

Ramuli primo densius brunneo- vel purpureo-brunneo-pubescentes, mox puberuli, demum glabri, cortice striato-reticulato cinereo obtecti. *Folia* plerumque oblonga vel oblongo-lanceolata, apice longius acuminata, acumine ipso acuto vel obtusiusculo, basi parum inaequilatera, cuneata vel rotundata, 6.5–20 cm. × 2.8–7.4 cm., chartacea, supra in costa densius pubescentia, ceterum glabra, subtus praecipue in costa nervisque molliter pubescentia, nervis 9–12 supra inconspicuis subtus prominentibus, venis transversis longis subtus prominulis, petiolo circa 3 mm. longo suffulta. Flores plerumque gemini, axillares (saepissime ex axillis foliorum delapsorum), pedicello et calyce et petalis externe ferrugineo-pubescentibus, pedicello 7–8 mm. longo paulo supra medium bracteola 8 mm. longa lineari-lanceolata basin versus bracteola minore instructo. *Sepala* aperta, anguste lanceolata, 1 cm. longa, 1.5 mm. lata, acuta. *Petala* exteriora sepalis similia nisi paulo breviora, interiora valvata, in alabastro vix 2.5 mm. longa. *Stamina* 6–7—seriata.

EASTERN HIMALAYA. Abor Hills: Ringing and Rotung; 450 m.; flowers in December, *Burkill* 36606, 37593, 37674.

952. *Vatica Shingkeng*, Dunn [Dipterocarpaceae-Vaticaeae]; *V. lanceolatae*, Blume affinis, sed foliis longe acuminatis et sepalis 2 auctis differt.

Arbor elata, glabra. *Cortex* crassus, griseo-brunneus, ramis lenticellatis. *Folia* alterna, lanceolata, longe acuminata vel caudata, basi rotundata, 9–18 cm. longa, chartacea, nervis 6–paribus ascendentibus trabeculis numerosis parallelis connexis subtus prominulis, petiolis 0.6–1 cm. longis. *Flores* ignoti. *Capsula* tarde dehiscens vel indehiscens, 2 cm. longa, globosa, breviter acuminata, in calyce persistente aucto patente insidens, sepalis 2 exterioribus ovatis obtusis striatis 3 cm. longis, interioribus 1–1.5 cm. longis. *Semina* angulata, pauca.

EASTERN HIMALAYA. Abor Hills: Rengging to Janakmukh;

forming pure forests of considerable size; Abor name Shing-keng. *Burkill* 36254, 36615, 37311, 37453.

953. **Rubus** (§*Malachobatus*) **Burkillii**, *Rolfe* [Rosaceae-Rubeae]; species distincta, e serie *Pacatorum*, Focke, ramis et petiolis aculeatis, foliorum lobis rotundatis, et floribus saepe corymbosis distinguenda.

Fruticosus, ramulis et petiolis aculeatis et cinereo-villosis. *Folia* suborbicularia, breviter 3-5 lobulata, basi cordata, breviter inciso-crenata, puberula, nervis reticulatis primariis parce aculeolatis, 5-9 cm. longa, 5-8 cm. lata; petioli 1-3 cm. longi; stipulae angustae, laciniatae, 5-7 mm. longae. *Flores* terminales et axillares, saepe corymbosi, 3-7 conferti. *Pedicelli* 5-7 mm. longi, puberuli. *Calyx* campanulatus, circiter 1 mm. longus, 5-lobus; lobi deltoideo-ovati, acuti, lateribus filamenis binis subulatis 2 mm. longis instructi. *Petala* obovata, 5-6 mm. longa. *Filamenta* 3-4 mm. longa. *Drupae* paucae, subsiccaae, rugosae; styli 2 mm. longi.

EASTERN HIMALAYA. Abor Hills: Kibo, *Burkill* 37005.

A very distinct species of the section *Malachobatus*, and apparently belonging to Focke's small series *Pacati*, which has hitherto only been known from China. It cannot be placed in the series *Rufi* from the character of the pubescence, and no very closely allied plant has been found at Kew.

954. **Eugenia aborensis**, *Dunn* [Myrtaceae-Myrteae]; *E. formosae*, Wall. similis foliis subsessilibus cordatis, sed foliis floribusque duplo minoribus longe distans.

Arbor glabra, 10 m. alta. *Folia* oblongo-lanceolata, acuminata, subsessilia, basi cordata, saepe amplexicaulia, 14-23 cm. longa, membranacea, integra, nervis multis gracilibus approximatis intra marginem anastomantibus infra prominulis, glandulis crebre punctata. *Flores* in cymis paucifloris terminalibus axillaribus vel lateralibus dispositi, 2 cm. diametro. *Calyx* late urceolatus, 8-9 mm. diametro, dentibus 5 latis brevibus. *Petala* rotundata, 6 mm. diametro. *Stamina* 5 mm. longa. *Stylus* 1.3 cm. longus. *Fructus* immaturus, globosus, 1 cm. diametro.

EASTERN HIMALAYA. Abor Hills: Balek and near Kebang; 700 m.; flowers in December and January. Abor name Ponkar. *Burkill* 36433, 36633, 37245, 37118.

955. **Begonia aborensis**, *Dunn* [Begoniaceae]; affinis *B. silhetensi*, C. B. Clarke, sed habitu robustiore, floribus bis majoribus distincta.

Herba dioica (?), acaulis. *Rhizoma* repens. *Foliorum* petioli ad 80 cm. longi, lineis multis albis notati, ut nervi primarii, laminarum paginae inferiores, pedunculi, sepala, capsulaeque molliter rubropilosi; laminae nitentes variegatae, oblique cordato-ovatae, acuminatae, ad 30 cm. longae, bullatae, obscure sinuatae, denticulatae, supra glaberrimae. *Pedunculi* ad 20 cm. longi. *Flores* lucide rosei, 4-5 cm. diametro. *Flores* ♂ multi, rotundati, umbellati; bracteae oblongo-ovatae, 2-3 cm. longae; pedicelli 4-5 cm. longi; sepala 2, rotundata vel ovata, 2 cm. longa; petala

paulo breviora, angustiora; stamina indefinita, libera, 7 mm. longa, antheris 2 mm. longis. *Flores* ♀ 1-3-ni; sepala et petala ut in ♂; styli 3, basi coaliti, 7 mm. longi; stigmata ramosa. *Fructus* globosus, 1.8 cm. diametro, 4-locularis, fissuris multis irregularibus verticalibus dehiscens.

EASTERN HIMALAYA. Outer Abor Hills: frequent on old overgrown clearings and extending just on to the plains as far as Lokpur; rarely in the forest, flowering in January; above Rotung, 300 m.; above Babuk, 1200 m.; between Kebang and the Dihong, 600 m., *Burkill* 36023, 36132, 36138, 36225, 36700, 36833, 36906, 37530, 37622, 37663, 37794, 36825.

Mr. Burkill sent living material of this species to the Lloyd Botanic Garden at Darjeeling when the plant was discovered. It grew there and produced flowers, specimens of which preserved in formalin were recently sent by the Curator, Mr. Cave, to Kew. These consisted of a large cluster of leaves interspersed with male flowering stems in all stages of development. The species is probably dioecious.

956. *Begonia Burkilli*, *Dunn* [Begoniaceae]; affinis *B. Roxburghii*, A.DC., sed flores multo majores.

Herba acaulis, omnino glabra. *Rhizoma* repens. *Foliorum* petioli 7-12 (-18) cm. longi; laminae maculis nigrescentibus saepe notatae, oblique cordato-ovatae vel lanceolatae, acuminatae, 10-20 cm. longae, sinuato-dentatae vel saepius integrae. *Florum* ♂ pedunculi 4-15 cm. longi, superne ramosi, 3-8 flori; pedicelli graciles, 3-5 cm. longi; bracteae membranaceae, oblongo-caudatae, 1-2 cm. longae; sepala 2, pallide rosea vel alba, obovata vel oblanceolata, acuta, 3-4 cm. longa; petala angusta, duplo breviora; stamina indefinita, libera, 7 mm. longa, antheris 2 mm. longis. *Flores* ♀ solitarii, in scapis gracilibus 4-5 cm. longis; sepala et petala ut in ♂; styli 2, basi coaliti, 8 mm. longi, ramosi. *Fructus* rhomboideus, utrinque acutus, 2 cm. longus, 1.5 cm. diametro, 4-locularis, cornubus duobus parvis in medio ornatus.

EASTERN HIMALAYA. Abor Hills: frequent on rocks by streams in the outer hills; 300-1000 m. *Burkill* 36121, 36315, 36910, 37121, 37139, 37375, 37455, 37706. The ♀ flowers are said to appear about three weeks after the ♂.

957. *Begonia iridescens*, *Dunn* [Begoniaceae]; affinis *B. Griffithii*, Hook. f., sed foliis majoribus, breviusque petiolatis distincta.

Herba monoica, acaulis. *Rhizoma* breve, crassum. *Folia* saepius duo, magna, humo adpressa, iridescentia, glauca, maculis argenteis elongatis inter nervis notata, oblique late ovata, breviter et obtuse acuminata, 20-35 cm. longa, obscure undulata, supra subglabra, subtus viridia, venis venulisque brunneo-tomentosis; petioli breves, 3-8 cm. longi, brunneo-hirsuti. *Flores* ♂ et ♀ in pedunculis (3-) 6-12 (-43) cm. longis superne copiose ramosis ut sepalis fructibusque parce rubro-hirsutis; bracteae multae, squarrosae, lanceolatae, 5 mm. longae; sepala rosea 1-1.5 cm. longa, ovato-oblonga, obtusa, superius saepe cucullatum; petala breviora, spathulata; stamina numerosa, 3 mm. longa,

erecta, libera, antheris 1.5 mm. longis; styli 2, basi coaliti, superne ramosi. Fructus bilocularis, ala una lineari, 1 cm. longa, a stylis distante et de eis directa, valvis lateraliter dehiscentibus.

EASTERN HIMALAYA. Abor Hills: very plentiful about Rengging and in the Lalik valley; growing flat against rocks or on the ground in deep shade, 500—1700 m. Flowers in January. *Burkill* 36111, 36246, 36247, 36270, 36673, 36831, 37315, 37336.

The stamens are said usually to be directed upwards under the hooded sepal.

958. *Begonia scintillans*, *Dunn* [Begoniaceae]; *B. Regi*, *Putzeys*, affinis, sed repens et foliis superne hispidis.

Herba monoica, acaulis. *Rhizoma* longum, gracile, ex nodis fasciculos radicum fibrosorum et saepe etiam folia 1–3 et pedunculos emittens, ubique ut petioli paleis rubidis vestitum; internodiis plerumque 4–5 cm. longis. *Foliorum* petioli 5–10 cm. longi; laminae saepissime maculis parvis albis inter nervis aggregatis pulcherrime ornatae, oblique rotundato-cordatae, acuminatae, 6–10 cm. longae, minute dentatae, supra virentes, pilis bulbosis crebre vestitae, subtus coccineae, rarius pilosae. *Flores* in pedunculis 3–12 cm. longis saepius terni, 2 ♂, 1 ♀, extus sparse pilosi; pedicelli graciles, 2–3 cm. longi; bracteae lanceolatae, acutae, 5 mm. longae. *Flores* ♂: sepala inaequalia, ovata, obtusa, majora 2 cm. longa, corallina; petala concoloria, duplo minora; stamina libera, numerosa, 3 mm. longa, antheris 1 mm. longis. *Florum* ♀: sepala et petala ut in ♂ at paulo minora; styli 3, basi coaliti, 4 mm. longi, stigmatibus tortuosis. *Fructus* immaturus rhomboideus, utrinque obtusus, 1 cm. longus, 6 mm. diametro, 3-alatus.

EASTERN HIMALAYA. Abor Hills: plentiful about the mountain of Bapu, both on the south face and towards Rotung; 1200—2000 m. *Burkill* 36219, 36543, 36820, 36928.

959. *Sadiria Boweri*, *Dunn* [Myrsinaceae-Myrsineae]; *S. Griffithii*, *Mez* affinis, sed glabra petiolisque longioribus.

Frutex ramosus, glaber, ramulis gracilibus quasi herbaceis. *Folia* ovata, apice acuminata, basi obtusa, integerrima vel undulato-dentata, 10–14 cm. longa, glandulis rubris praecipue prope marginem dispersa, nervis 12–13-paribus subtus prominulis, petiolis saepe 1.5–5 cm. longis. *Flores* in cymis brevibus 1.5–2 cm. longis deflexis axillaribus densis aggregati, deorsum directi. *Sepala* 5, basi breviter coalita, triangularia, margine serrulata, 1–1.5 mm. longa, aperta. *Petala* 5, integra, per $\frac{2}{3}$ longitudinis in tubo coalita, lobis contortis ovalibus, incarnata. *Stamina* 5, petalis paulo breviora, filamentis brevissimis petalis basi affixa. *Ovarium* globosum, stylo gracili petala paulo excedente; stigma punctiforme; placenta ovata, uniseriatim 5-ovulata. *Fructus* ignotus.

EASTERN HIMALAYA. Abor Hills: summit of Bapu; 2000 m., *Burkill* 36929.

Named at Mr. *Burkill*'s request in honour of Major-General Sir Hamilton Bower, K.C.B., who planned and carried out the expedition to the Abor Hills on which these plants were collected.

960. *Arundinella intricata*, Hughes [Gramineae-Arundinelleae]; affinis *A. brasiliensi*, Raddi, sed panicula minore magis contracta, axibus ad angulos dense et manifeste ciliatis, glumis latioribus magis abrupte acutis, gluma inferiore $\frac{3}{4}$ spiculae aequilonga, aristae columna plerumque brevior differt.

Perennis, dense et intricatim caespitosa. *Culmi* erecti vel geniculati, 30–60 cm. alti, stricti, glabri, 4–10-nodi, supra basin ramis foliosis erectis. *Foliorum* vaginae firmae, apertiusculae, laeves, striatae, marginibus dense ciliatae, inferiores persistentes; ligulae brevissimae, truncatae, interdum in dorso dense fimbriatae; laminae lineares, in acumen longe attenuatae, 0.5–2.2 cm. latae, planae vel involutae, rigidulae vel subflexuosae, glabrae vel supra nonnunquam pilis paucis dissitis, in margine scabrae. *Panicula* ovata vel oblonga, contracta, 6.5–12.5 cm. longa, 1–2 cm. lata; axis primarius acute angulosus atque sulcatus, angulis marginatis dense conspicueque ciliatis; rami solitarii vel 2-nati, inaequaliter dispositi, paniculam dimidiam aequantes; pedicelli 0.5–2 mm. longi, ciliati, apice discoidei. *Spiculae* hiantes, 4 mm. longae; gluma inferior ovata, acuminata, interdum setaceo-acuminata, 3 mm. longa, distincte 3–5-nervis; superior ovata, acuta vel acuminata, apice leviter recurva, 4 mm. longa, 5-nervis. *Anthoecium inferum* ♂, raro ovario rudimentario addito; valva ovata, acuta vel acuminata, recta vel subrecta, 4 mm. longa, 5-nervis; valvula ovato-oblonga, acuta, 3 mm. longa, carinis infra marginatis supra scaberulis, flexuris tenuissime ciliatis; antherae 1.5 mm. longae. *Anthoecium superum* ♀; valva oblonga, obsolete bifida, 2.5 mm. longa, chartacea, minutissime scaberula; valvula anguste oblonga, 2 mm. longa, inter carinas scaberula.

KHASIA HILLS. Maosmai; 1220 m., Clarke 16588: Mahadeo; 915 m., Clarke 155622: Amwé; 1220–1525 m., J. D. Hooker: Boga-Panee; 1220–1830 m., J. D. Hooker 2001.

ABOR COUNTRY. Dihang River; bank near Ritung; 30 m., Burkill 373.

“A grass which makes tussocks, and in places quite clothes the bank above the river. It mats its tussocks together with its roots which come out at the top of the soil as well as run all through it.” (Burkill.)

This was probably included in *A. brasiliensis*, Raddi, by Hooker in his Flora of British India, p. 73, but he does not quote any of the specimens enumerated here.

XVI.—MISCELLANEOUS NOTE.

MR. W. G. CRAIB, F.L.S., Lecturer on Forest Botany and Indian Forest Trees in the University of Edinburgh (*K.B.*, 1915, 355), and formerly Assistant for India in the Herbarium at Kew (*K.B.*, 1909, 225), has been appointed by the Crown, Regius Professor of Botany in the University of Aberdeen in succession to the late Professor J. W. H. Trail, F.R.S.